Great Lakes Fishery Commission

ESTABLISHED BY CONVENTION BETWEEN CANADA AND THE UNITED STATES TO IMPROVE AND PERPETUATE FISHERY RESOURCES

Lake Michigan Technical Committee
Annual Report to the Lake Michigan Committee
For the Period March 2008 – March 2009

Meetings

The Lake Michigan Technical Committee (LMTC) met two times since March of 2008. A summer meeting was held in Traverse City, MI in July 2008 and a winter meeting was held in Des Plaines, IL, in January 2009. Minutes were taken and distributed for both meetings.

State of Lake Michigan (2005)

The 2005 State of Lake Michigan report has been completed and printed as special publication 08-02. Special thanks go to the two main editors of this report, Bill Horns (WDNR) and Dave Clapp (MDNR).

Yellow Perch Task Group

All agencies participated in spring assessments to monitor adult yellow perch populations using standard graded mesh gill nets. Strong recruitment of the 2005 year class was apparent in data collected in most assessments; yellow perch from the 2005 year class made up approximately 20-60% of the adult population in the various state waters. Continued survival of the 1998 year class (age 10) is also apparent in data collected in Illinois (>5% of the adult population) and Wisconsin (>10% of the adult population) waters of Lake Michigan. Data from common mesh sizes fished in all jurisdictions show that current adult yellow perch abundance remains well below the historically observed abundance of the late 1980s and early 1990s. While catch of age-0 yellow perch in 2008 was slightly greater than that observed in 2007 in some areas of southern Lake Michigan, recruitment in general was relatively low (weak) in most areas of the lake, in comparison to long-term averages.

The YPTG agreed to implement a lakewide summer "micromesh" gill net assessment (beginning in summer 2007) to standardize assessment of young-of-year yellow perch production, especially in areas where standard trawl and seine surveys cannot be implemented. Expanded (locations and mesh sizes) micromesh gill net sampling occurred in 2008. Catches were highest in Indiana and Illinois waters, and peak catches came in 12.5 and 16.0 mm (stretched) mesh nets. Indications from the first two summers of implementation are that this will be a valuable assessment for providing a comparable measure of young-of-year yellow perch abundance across all nearshore habitats in Lake Michigan.

A decision analysis "technology transfer" workshop was held in conjunction with the summer 2008 LMTC meeting in Traverse City, Michigan. Participants included QFC investigators, YPTG members, LMC, and other invited agency managers. Following extensive discussions among YPTG members of the information presented at the workshop, along with results of most recent assessments, a "will live with" consensus was reached to recommend (to the LMC) maintenance of current Lake Michigan yellow perch regulations / fishing mortality levels. The rationale for this recommendation was that recent assessments have not shown a significant (expected) population response that could be attributed to the reduced mortality levels brought about by regulation changes implemented during the 1995-2000 period. The absence of an expected response may be the result of a "regime shift" brought about by the ongoing effects of invasive species (primarily zebra and quagga mussels) on the Lake Michigan ecosystem.

A winter 2009 meeting of the YPTG was held on January 7, 2009, at the Indiana DNR office in Michigan City. Agenda items at this meeting included discussion of the Decision Analysis project, regulation criteria and potential regulation changes, standard assessment protocols (including added lakewide assessments), annual report guidelines and preparation, impediments to further recovery of yellow perch stocks, and direction / additional charges from the LMC.

No significant changes occurred during 2008 with regards to regulations for sport or commercial harvest of yellow perch. No changes are anticipated for 2009.

Integrated management of sea lampreys in Lake Michigan

The Great Lakes Fishery Commission and the U.S. Fish and Wildlife Service continued to implement Integrated Management of Sea Lampreys (IMSL) in Lake Michigan. During 2008, sea lamprey numbers were greater than the Fish Community Objective target for Lake Michigan. Sea lamprey numbers were estimated to be 104,823 (96,764 – 116,642, 95% confidence interval), a significant decrease from 2007. Sea lamprey numbers were less than or within the target range prior to the 2000 spawning year, but have been greater than targets since the 2000 spawning year (Figure 1).

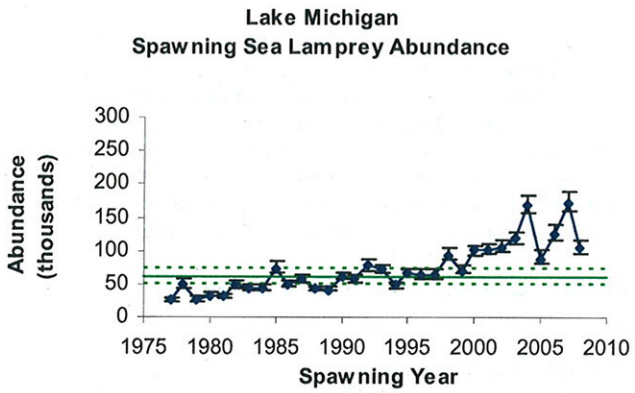


Figure 1. Abundance estimates with 95% CIs of spawning-phase sea lampreys. Target abundance and 95% CI range were estimated from abundances during a period with acceptable marking rates (horizontal solid and dashed lines).

Twenty six streams were treated in 2008 and assessments of sea lamprey larvae were conducted to search for new or monitor existing populations in 76 tributaries and offshore of 28 tributaries. Beginning in 2001, the amount of treatment effort increased with special emphasis on increasing suppression in Lake Michigan. Significantly more annual control effort was directed to Lake Michigan during 2001 – 2008 than during the previous six years. The Manistique River was treated in 2003, 2004 and 2007, and is scheduled to be treated again in 2009. "Geographic efficiency" was applied to expand the number of

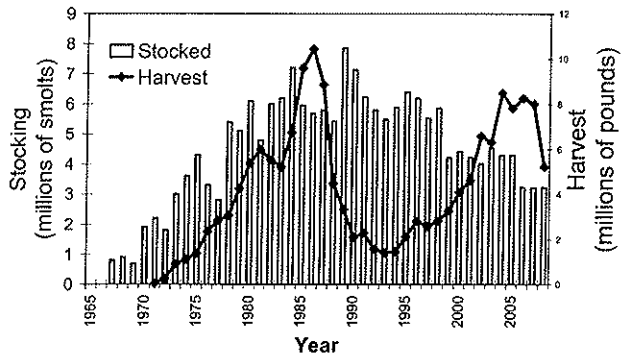
streams treated, that is, control crews added small streams that would not have ranked for treatment, but could be treated during field trips because they were located near other scheduled streams. Beginning in 2005, the states and tribes of Michigan and Wisconsin agreed to increased TFM concentrations in select sturgeon streams to maximize treatment effectiveness. Treatments of streams with sturgeon reproduction are still scheduled later during the year, when young sturgeons are less vulnerable. The control agents implemented options to improve treatment effectiveness on some streams during 2006 to 2008, including applying longer lampricide blocks, using higher concentrations, increasing secondary applications of lampricides to backwaters and small tributary confluences and scheduling of streams to increase the likelihood of favorable flow conditions.

Working with the GLFC, the Service is currently developing an outline for a long-term plan to manage sea lampreys in Lake Michigan. Following GLFC approval, the plan will be designed to coordinate and implement sea lamprey management and assist in program decision making and communication among sea lamprey control agents, fish managers, Commissioners and stakeholders. Plans will follow and support the GLFC's Vision and Fish Community Objectives, and will include various sections that describe the history and background of sea lamprey management, sources of sea lamprey production and tactics that will be implemented to move towards target levels of sea lamprey abundance.

Salmonid Working Group

Chinook salmon stocking rates (e.g., 1999 and 2006) have been adjusted through a cooperative process in an attempt to minimize the risk of a lakewide population crash and its effects on the fishery. Stocking reductions were based on a review of biological indicators from the SWG and reflected the consensus of managers from each agency involved in stocking. To help this process the SWG is committed to including new indicators (e.g., information on coho salmon and lake trout) and continuing the ongoing collection and consolidation of lake-wide time series data on salmonines in Lake Michigan. Chinook salmon harvest in 2004-2007 was above the established reference level set forth in the Salmonine Objective for Lake Michigan (3.1 million kg - 6.8 million pounds; Figure 1), but dropped substantially into the FCO range in 2008. This observation was expected based on our analysis of the 2007 Red Flag parameters where the SWG concluded that the previous harvest levels were not sustainable and declines in fishery catch rates and harvest levels in the near future are eminent. Even though indicators of salmon abundance suggested that there was a decline in 2008, the frequency distributions of the selected parameters were outside of the acceptable ranges indicating that 53% (8 of 15) of the variables triggered level I red flags and 93% (14 of 15) of the variable triggered level II red flags.

Figure 1. Chinook salmon stocking and harvest



Because over 50% of the level I and II red flag indicators were triggered in 2008, the SWG recommends to the Lake Michigan Committee (LMC) that additional review of the salmonine management strategy should be taken to bring a better balance between predator and prey levels. Managers may want to encourage that special attention be paid to the predator-prey levels in 2009 as the system appears to be unstable. In addition, the loss of valuable indicators (e.g., Chinook salmon diet samples) will severely impede the SWG's ability to fully assess the status of predator-prey levels relative to management objectives.

Planktivore Working Group

USGS and MDMR staff provided prey fish reports and presentations in March of 2008 including results of Lake Michigan bottom trawl and acoustic surveys conducted in 2007. USGS staff also provided a report on cross-basin status and trends of prey fish in 2007. Lake Michigan survey results were also provided to the Salmonid Working Group for inclusion in the Red Flags Report. These working group members also conducted lakewide bottom trawl and acoustic surveys in 2008. Results of the 2008 surveys will be presented in March 2009 and are summarized below.

Acoustic survey

Mean total prey fish biomass was 15.3 kg/ha (relative standard error, RSE = 7.6%) or ~82 kilotonnes (kt, 1,000 metric tons), which was 1.9 times higher than the estimate for 2007 but 78% lower than the long-term mean. The increase from 2007 was because of increased biomass of age-1 and age-3 alewife. The 2008 alewife year-class contributed ~12% of total alewife biomass (11.0 kg/ha, RSE = 9.0%), while the 2007 and 2005 alewife year-classes contributed ~33% and 35%, respectively. In 2008, alewife comprised 72% of total biomass, while rainbow smelt and bloater were 11 and 17% of total biomass, respectively. Rainbow smelt biomass in 2008 (1.6 kg/ha, RSE = 10.6%) was identical to the biomass in 2007 (1.6 kg/ha). Bloater biomass was again much lower (2.6 kg/ha, RSE = 15.2%) than in the 1990s, but mean density of small bloater in 2008 (534 fish/ha, RSE = 10.9) was the highest observed in any acoustic survey on record. Prey fish biomass remained well below the Fish Community Objectives target of 500-800 kt and only alewife and small bloater are above or near long-term mean biomass levels.

Bottom Trawl Survey-main basin

Based on the U.S. Geological Survey Great Lakes Science Center lake-wide bottom trawl survey, lake-wide biomass of alewives in 2008 was estimated at 8.27 kilotonnes (kt) (1 kt = 1000 metric tons), which was the smallest biomass estimate in the entire time series and 29% lower than the 2007 estimate. Lake-wide biomass of bloater in 2008 was estimated at 3.33 kt, which was the lowest estimate since 1977 and 38% lower than the 2007 estimate. Rainbow smelt lake-wide biomass equaled 0.89 kt, which was only 0.01 kt higher than 2007, which is the lowest estimate in the time series. Deepwater sculpin lake-wide biomass equaled 5.23 kt, which is the fourth straight year of declining biomass. The 2008 estimate is the second smallest in the time series, and 39% lower than the 2007 estimate. Slimy sculpin lake-wide biomass remained relatively high in 2008 (2.75 kt), increasing 25% over 2007. Ninespine stickleback lake-wide biomass equaled only 0.50 kt in 2008, which was 79% lower than the 2007 estimate. The final prey fish, exotic round goby, increased two orders of magnitude between 2007 and 2008, from 0.02 to 4.65 kt. Round gobies now represent 18% of the prey fish biomass. Burbot lake-wide biomass (0.91 kt in 2008) has remained fairly constant since 2002. Numeric density of age-0 yellow perch (i.e., < 100 mm) equaled 0.7 fish per ha, which is indicative of a relatively poor year-class. Lake-wide biomass of dreissenid mussels dropped precipitously in 2008, down to 9.47 kt, and a 96% decline from the 2007 biomass estimate. Overall, the total lake-wide prey fish biomass estimate (sum of alewife, bloater, rainbow smelt, deepwater sculpin, slimy sculpin, round goby, and ninespine stickleback) in 2008 was 25.62 kt, which was the lowest observed since the survey began in 1973.

Bottom trawl survey-Green Bay

In 2008, total catch and CPE increased over 2007 levels and was our second highest catch since trawling began in 2003. The largest increases in CPE in 2008 over 2007 levels were for lake whitefish, dreissenid mussels, and round goby. Declines in CPE were noted for gizzard shad and freshwater drum. Other species such as alewife, rainbow smelt, white sucker and trout-perch had moderate increases in CPE in 2008. Since 2003 lake whitefish have dominated the catch by weight. Within the lake whitefish catch by number, young of year and juvenile whitefish have been well represented in our sample. Alewife CPE has been variable throughout the time period, but has been increasing the past three years. The rainbow smelt population trend remains unclear. Total rainbow smelt CPE and young of year abundance increased in 2008 after poor catches in 2006 and 2007. Trout-perch CPE has been increasing throughout the sample period. Yellow perch CPE after increasing from 2003 through 2006 has declined the past two years. Round goby after experiencing a sharp decline in CPE in 2007 rebounded in 2008 to reach the highest CPE we have measured during the survey period. The largest increases in round goby CPE were noted at 50 feet and 60 feet. Dreissenid mussel CPE after declining since 2003 increased in 2008. Most dreissenid mussels were encountered in waters less than 70 feet deep.

Lakewide Harvest Report

Harvest data was compiled from Lake Michigan fisheries research and management agencies. Pounds of fish harvested are estimated for 22 species from commercial and sport fishing, weir harvest, assessment surveys and incidental catch by the commercial fishery. Updates are completed annually as new data becomes available and verified.

The total biomass of fish harvested during 2008 is estimated at 13.3 million pounds. The peak harvest for the survey period (1985 to present) was 56.6 million pounds during 1985. Harvest averaged 38 million pounds from 1985 through 1994, and 18.5 million pounds from 1995 to the present, and showed a general downward trend. The 2008 harvest estimates showed a decline as a result of reduced harvest in sport fishing tied directly to Chinook salmon harvest. The bulk of the reduction in harvest during the early 1990's is due to closure of the commercial yellow perch and alewife fisheries as well as a reduction in the Chinook sport harvest.

Overall, harvest from 1994 to the present has been within sustainable harvest limits of 12.2 to 25.5 million pounds, as outlined in the Fish-Community Objectives for Lake Michigan (Eshenroder et al. 1995). Prior to 1994, harvest levels exceeded the upper limit of sustainable harvest. The 13.3 million pounds total harvest is the lowest level for the time series, however.

The salmonine harvest of 7.2 million pounds during 2008 was approximately 3 million pounds less than the previous year. This level of harvested pounds has not been this low since 1995. Salmonine forage appears to be available in some areas of the Lake, but there is reduced condition and abundance of forage.

Benthivore harvest continues to be dominated by lake whitefish, with the commercial fishery being the primary source. The harvest of lake whitefish had been declining for the period 1996 to 2002 but has stabilized around 4.25 million pounds. The benthivore fishery totaled 4.8 million pounds during 2008. The harvest level for 2003-2008 falls within the sustainable harvest target range of 4 to 6 million pounds set by Eshenroder et al. (1995).

The harvest of inshore fishes was within the target range of 2.2 to 4.4 million pounds from 1985 through 1995, but has remained well below target levels since that time. Harvest during 2008 was 802,000 pounds, primarily comprised of yellow perch and walleye. The yellow perch sport harvest has averaged 400,000 pounds since the bag limit reductions were introduced in 1997. The harvest of yellow perch by sport anglers was 424,000 pounds during 2008. The 2002, 2003, and 2004 year classes made up the bulk of the fishery in 2008 with some fish from the 1998 year class still present as 10 year old fish. Recruitment from the 2005 year-classes may add to the harvest in the upcoming years (YPTG).

Commercial pounds harvested have shown a decrease in 2008. The estimated harvest of commercially valuable species during 2008 declined to 5.8 million pounds, with lake whitefish providing the bulk of the fishery. Lake whitefish harvest in 2008 had a slight increase to 4.7 million pounds. Commercial harvest of other species continued a downward trend during the 1990's and into the 2000's, due to a decline in all commercially fished species and the closure of the yellow perch and alewife fisheries. Harvest of all seven major species during 2008 was lower relative to the ten-year average and remains below 10 million pounds for the entire decade of 2000's. Bloater harvest was 295,000 pounds and has dropped below one million pounds harvested for the third consecutive year and is currently at it lowest level for the 24-year time period.

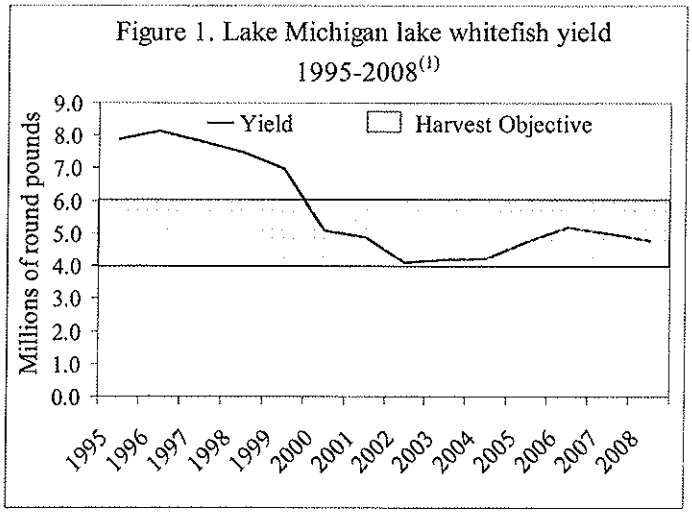
Lakewide Stocking

Nearly twelve million trout and salmon were stocked in Lake Michigan during 2008. This level of stocking is similar to last year and is consistent with management objectives to reduce predator demands on the Lake Michigan forage base and yet rehabilitate lake trout populations. In 2006 Lake Michigan managers enacted a 25% stocking reduction for chinook salmon in response to the record low levels of forage fish, and in particular alewife, biomass. Under this paradigm 2.7 million chinook were stocked in 2008 compared to the previous 10 year average of 3.9 million. Stocking supplements natural reproduction which accounts for roughly half of the Chinook salmon in Lake Michigan.

The *Guide for the Rehabilitation of Lake Trout in Lake Michigan* outlines the future direction for lake trout restoration, though to date it has not been ratified by all four states. In general, the guide calls for increased stocking rates up to 3.7 million yearlings within Priority One areas which consist of offshore reefs with good habitat and relatively low mortality. In 2008, the US Fish and Wildlife Service stocked over 1.9 million lake trout yearlings in Priority One offshore reefs, while one million yearlings and over 500,000 fall fingerlings were also stocked in near-shore areas to meet Consent Decree of 2000 obligations and to enhance recreational fishery opportunities.

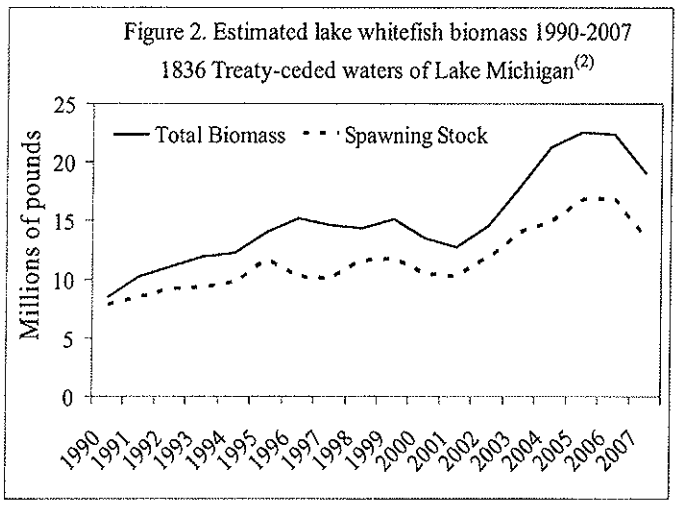
Benthivore Working Group

The primary function of the Benthivore Working Group (BWG) is to compile and disseminate biological information on key benthivore species to the member agencies of the LMTC and to the Lake Michigan Committee (LMC). For more detailed information on progress achieved, a summary of significant research, and recommendations, please refer to the full report.



Lake Whitefish Harvest Objective

During 1995-2008, the average lakewide yield of whitefish was approximately six million round pounds, the upper range of the target established in the FCO (Figure 1). In 2000, yield declined from the 1995-1999 average of 7.7 million pounds to just over five million pounds, largely as a consequence of reduced gill-net effort in treaty waters. Since 2000, lakewide yield has remained quite stable (range of 4.1 to 5.2 million pounds). The 2008 preliminary lakewide yield of lake whitefish was 4.8 million pounds.



Strong recruitment in the early part of the decade, particularly in the northern waters of Lake Michigan, coupled with declining fishery mortality, contributed to increased standing stock biomass estimates during 2001 to 2006 (an example from the treaty catch-at-age models is provided in Figure 2). While the most recent estimates suggest a decline from the 2005 peak, standing stock biomass remains high relative to estimates from the 1990s. Although growth had largely stabilized from the long-term decline which began in the early 1990s, concerns remain over the potential for continued lower trophic-level disturbance to impact growth in the future.

Important contributions from the research community, particularly in the areas of whitefish stock delineation, movement, and natural mortality has enhanced our understanding of whitefish stock dynamics and will likely contribute to the future management of the species.

Lake Sturgeon Task Group

A revised draft of the *Stocking Guidelines for the Genetic Management of Lake Sturgeon in the Great Lakes Basin* (Welsh et al.) was developed following extensive review and comments by resource agencies and institutions during the summer of 2008. Nine co-authors including representatives from MDNR, WDNR, LRBOI and USFWS have been involved in completion of this document. Next, it will be re-circulated again to the management agencies and prepared for publication by the GLFC. This document provides an important cornerstone for completion of a Lake Michigan Lake Sturgeon Rehabilitation Plan or Guide which the Lake Sturgeon Task Group is again focusing on to produce a revised draft for review in 2009.

Members of the Task Group continue to implement and evaluate streamside rearing to reintroduce and rehabilitate lake sturgeon populations. The Milwaukee River facility operated for a third year and stocked 767 fingerling sturgeon in 2008; 27 and 158 fish were stocked in 2006-2007. The Manistee River facility completed a 5th year of rearing assistance, releasing 47 fingerlings; 51, 92, and 29 were released in 2005-2007. The Whitefish and Cedar River facilities did not operate in 2008 due to unsuccessful gamete collections from the Menominee River; 772 and 189 fingerlings were stocked from these facilities in 2007. The Manitowoc River facility also did not operate in 2008 due to water quality issues. In 2009, the Manitowoc facility will be relocated to the Kewaunee River and gamete collections will expand to include the Peshtigo in addition to the Menominee and Wolf Rivers.

In 2008, several research and status assessments focused on early life history dynamics and recruitment, population status, stock discrimination and mixed stock analysis using genetics, and movement and distribution of lake sturgeon in several regions of Lake Michigan. Initiatives also continue in several rivers to improve habitat, remove barriers, improve flow regimes, reduce entrainment, and plan for installation of effective fish passage for sturgeon.

Research Priorities

During the summer of 2008 and then finalized at the summer meeting in July, the Lake Michigan Technical Committee decided on these top three research priorities:

1) What contributions do naturalized fish make to the lakewide salmonine abundances, production, forage, demand and annual yield?

2) What levels of salmonine production and yield are achievable without threatening the biological integrity of the LM fish community? The biological integrity of the salmonine community would be considered threatened if high levels of forage demand substantially increased the risk of a collapse of the salmonine fishery as was experienced in the late 1980's.

3) What indexes would best provide an early warning sing that the forage demand of the salmonine community is near to exceeding the capacity of the LM system?

The group also decided that the entire list of 24 research items identified by the LMTC should be included in the document sent to the GLFC and posted on the website at:
http://www.glfc.org/research/FisheryDesc.php

Submitted:
Brad Eggold, Chair
Lake Michigan Technical Committee
March 24, 2009